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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,496	11/26/2003	Scott Mordin Hoyte	128593	9533
7590	09/29/2004		EXAMINER	
John S. Beulick Armstrong Teasdale LLP One Metropolitan Square, Suite 2600 St. Louis, MO 63102			NGHIEM, MICHAEL P	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/723,496	HOYTE ET AL.
	Examiner Michael P Nghiem	Art Unit 2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-32 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-4,11,13,15-24 and 31 is/are rejected.  
 7) Claim(s) 5-10,12,14,25-30 and 32 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 26 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>11-26-03</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Specification***

1. The disclosure is objected to because of the following informalities:

- "generator" (paragraph 0026, line 2) should be -- generator --.

Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the output circuit (claim 19) and the digital signal output (claim 20) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 11, 13, 15-19, 21-24, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Danielson (US 5,541,510).

Regarding claims 1, 13, 15, and 21, Danielson discloses a method and apparatus (Figs. 2, 3) for measuring the distance (d) of a gap (gap, Figs. 1, 2) separating an eddy current transducer (16) and a target (22), said method comprising:

- determining a normalized impedance curve (31, 32, 34, 36) for the transducer (Fig. 2);
  - determining a time rate of change of the normalized impedance (changes in normalized real impedance, Fig. 2) of the transducer along a line of constant gap (40, 42, 44, 46);
    - correcting an apparent gap magnitude using the determined time rate of change (column 5, lines 61 – column 6, line 3).

Regarding claims 2, 13, and 22, Danielson discloses:

- calculating a complex electrical impedance value of the eddy current transducer at a plurality of gap distance values (column 5, lines 35-60);
  - normalizing the complex electrical impedance value (column 6, lines 4-6).

Regarding claims 3 and 23, Danielson discloses determining a normalized impedance curve in real-time (determination, while happening, is deemed to be in real-time).

Regarding claims 4 and 24, Danielson discloses determining a time rate of change due to a magnetic field of the target (magnetic field of coils, Fig. 3).

Regarding claims 11 and 31, Danielson discloses determining an orientation of the target in a magnetic field with respect to the eddy current transducer (column 2, column 53-56).

Regarding claim 15, Danielson further discloses a processor (70) operatively coupled to said transducer (Fig. 3).

Regarding claim 16, Danielson discloses:

- a signal generator (50) operatively coupled to said eddy current transducer configured to drive a current through said eddy current transducer (Fig. 3);
- a sampling circuit (58) configured to sample and digitize an analog voltage impressed across said eddy current transducer (Fig. 3);
- a convolver circuit (convolving means in 70) for convolving the digitized voltage with a digital waveform for forming a complex number correlative to the analog voltage impressed across said eddy current transducer wherein said processor is configured to process the complex number into a gap distance value correlative to a gap distance between said eddy current transducer and the conductive target material (71, real and imaginary impedances displayed in Fig. 2).

Regarding claim 17, Danielson discloses that said processor is configured to process the eddy current transducer impedance and a measured frequency of the current driving said eddy current transducer to generate a normalized impedance curve (impedance and frequency are received by detection circuits 58, 60 respectively and then processed by 70, Fig. 3).

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Regarding claim 18, Danielson discloses that said signal generator is configured to adjust the frequency of the current driving said eddy current transducer (Fig. 3).

Regarding claim 19, Danielson discloses an output circuit (58) configured to output a signal as a function of the gap distance value which is correlative to said gap distance between said eddy current transducer and said conductive target material (Fig. 3).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Danielson in view of Slates (US 6,765,395).

Danielson further discloses a digital signal output (output of 66).

However, Danielson does not disclose at least one of a display and an analog signal output.

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Nevertheless, Slates discloses a display (150) and an analog signal output (142) for the purpose of helping with the process of measuring a gap between a proximity probe (12) and a conductive target material (T) (Fig. 1).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Danielson with a display and an analog signal output as disclosed by Slates for the purpose of helping with the process of measuring a gap between a proximity probe and a conductive target material.

***Allowable Subject Matter***

5. Claims 5-10, 12, 14, 25-30, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Reasons For Allowance***

6. The combination and method as claimed wherein correcting the apparent gap to facilitate reducing a contribution to the apparent gap by a magnetic field of the target (claims 5, 25) or correcting an apparent vibration magnitude using the determined time rate of change (claims 6, 14, 26) or determining the strength of a magnetic field based on the time rate of change of the transducer normalized impedance along a line

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of constant gap (claims 9, 29) or determining whether the target has been exposed to an external magnetic field (claims 10, 30) or modifying a proximity algorithm to facilitate modifying the transducer output signal due to external magnetic fields (claims 12, 32) is not disclosed, suggested, or made obvious by the prior art of record.

***Contact Information***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Nghiem whose telephone number is (571) 272-2277. The examiner can normally be reached on M-H from 6:30AM – 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached at (571) 272-2269. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
MICHAEL NGHIEM  
PRIMARY EXAMINER

Michael Nghiem

September 24, 2004